Computer Science Engineering Sample Papers

1 The problems 3-SAT and 2-SAT are
A) both in P
B) both NP-complete
C) NP-complete and in P respectively
D) undecidable and NP-complete respectively
Answer : (C)

2 Consider the following relation schema pertaining to a students database:
Student (rollno, name, address)
Enroll (rollno, courseno, coursename)
where the primary keys are shown underlined. The number of tuples in the Student and Enroll tables are 120 and 8 respectively. What are the maximum and minimum number of tuples that can be present in (Student * Enroll), where '*'denotes natural join?
A) 8, 8
B) 120, 8
C) 960, 8
D) 960, 120
Answer : (C)

3 Consider a relation scheme R = (A, B, C, D, E, H) on which the following functional dependencies hold : (A -> B, BC -> D, E -> C, D -> A). What are the candidate keys of R?
A) AE, BE
B) AE, BE, DE
C) AEH, BEH, BCH
D) AEH, BEH, DEH
Answer : (D)

4 The goal of structured programming is to
A) have well indented programs
B) be able to infer the flow of control from the compiled code
C) be able to infer the flow of control from the program text
D) avoid the use of GOTO statements
Answer : (C)

5 The tightest lower bound on the number of comparisons, in the worst ease, for comparison-based sorting is of the order of
A) n
B) n^2
C) n log n
D) $n \log^2 n$
Answer : (B)

6 A circuit outputs a digit in the form of 4 bits. 0 is represented by 0000,1 by 0001,...,

9 by 1001. A combinational circuit is to be designed which takes these 4 bits as input and outputs 1 if the digit ³ 5, and 0 otherwise. If only AND, OR and NOT gates may be used, what is the minimum number of gates required
A) 2
B) 3
C) 4
D) 5
Answer : (C)

7 WA and B are the only two stations on an Ethernet. Each has a steady queue of frames to send. Both A and B attempt to transmit a frame, collide, and A wins the first backoff race. At the end of this successful transmission by A, both A and B attempt to transmit and collide. The probability that A wins the second backoff race is
A) 0.5
B) 0.625
C) 0.75
D) 1.0
Answer : (A)

8 If 73_x (in base-x number system) is equal to 54_y (in base-y number system), the possible values of x and y are
A) 8, 16
B) 10, 12
C) 9, 13
D) 8, 11
Answer : (D)

9 In a packet switching network, packets are routed from source to destination along a single path having two intermediate nodes. If the message size is 24 bytes and each packet contains a header of 3 bytes, then the optimum packet size is
A) 4
B) 6
C) 7
D) 9
Answer : (D)

10 A Priority-Queue is implemented as a Max-Heap. Initially, it has 5 elements. The level-order traversal of the heap is given below: 10, 8,5,3,2 Two new elements 1 and 7 are inserted in the heap in that order. The level-order traversal of the heap after the insertion of the elements is
A) 10,8,7,5,3,2,1
B) 10,8,7,2,3,1,5
C) 10,8,7,1,2,3,5
D) 10,8,7,3,2,1,5
Answer : (D)

11 Consider an operating system capable of loading and executing a single sequential user process at a time. The disk head scheduling algorithm used is First Come First Served (FCFS). If FCFS is replaced by Shortest Seek Time First (SSTF), claimed by the vendor to give 50% better benchmark results, what is the expected improvement in the I/O performance of user programs ?
A) 50%
B) 40%
C) 25%br> D) 0%
Answer : (D)

12 How many distinct binary search trees can be created out of 4 distinct keys?
A) 5
B) 14
C) 24
D) 42
Answer : (B)